

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

To:

see form PCT/ISA/220

### WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/EP2004/011457

International filing date (day/month/year)  
12.10.2004

Priority date (day/month/year)  
15.10.2003

International Patent Classification (IPC) or both national classification and IPC  
C10G11/04, C10G11/05, C10G11/18, B01J23/10

Applicant  
AKZO NOBEL N.V.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/EP2004/011457

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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-9
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-9
Industrial applicability (IA)	Yes: Claims	1-9
	No: Claims	

2. Citations and explanations

**see separate sheet**

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**Box No. VIII Certain observations on the international application**

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

1. Reference is made to the following document:  
D1: WO-A-0112570
2. The present application does not meet the requirements of Article 33(1) PCT, because the subject-matter of claims 1-9 does not involve an inventive step in the sense of Article 33(3) PCT in view of document D1.
- 2.1 The subject-matter of independent claim 1 is novel, since the combination of features is not disclosed in any of the available prior art documents.

Therefore, claims 1-9 fulfill the requirements of Article 33(2) PCT.

- 2.2 Document D1, which is considered to represent the most relevant state of the art, discloses crystalline anionic clay containing bodies from which the subject-matter of independent claim 1 differs in that the composition comprises FCC catalyst particles and additive particles, wherein the additive particle comprises Y-type zeolite.

There is currently no evidence on file to support any unexpected effects or properties in relation to the above identified difference, since in example 2 REY exchanged with 12 wt% rare earth is used (instead of Y-type zeolite). The nature of the comparison with the closest prior art should have been such that the effect is convincingly shown to have its origin in the **distinguishing feature of the invention**.

Alleged but unsupported advantages cannot be taken into consideration in respect of the determination of the problem underlying the application.

Besides, in claim 1 the amount of Y-type zeolite is not defined; the amount ranges from practically 0 wt% to almost 100 wt% of the additive composition. No unexpected effect has been shown over the whole breadth of scope.

In view of the above, the problem underlying the invention (see page 1, lines 28-29 of the current specification) has to be reformulated and may be regarded as to provide a

further composition.

D1 discloses that the crystalline anionic clay containing bodies may contain molecular sieve material, e.g. zeolite Y, ZSM-5 etcetera; the multifunctional bodies can be used as a catalyst additive (see page 10, lines 20-29).

The suitability of anionic clay containing shaped bodies for the **removal of SO<sub>x</sub>** and/or **NO<sub>x</sub> compounds** in FCC may be improved by addition of **Ce** and/or **V** (see page 10, lines 11-13). In several examples of D1, the bodies were tested as an FCC additive.

Therefore, it is not possible to recognise an inventive step for claims 1 and 9 and the subject-matter of claims 1 and 9 does not fulfill the requirements Article 33(3) PCT.

- 2.3 The process for preparing a composition as is defined in independent claim 6 is obvious in light of D1 and the problem underlying said claim.

Document D1 discloses (see page 10, lines 20-26) that the anionic clay bodies can be combined with conventional catalyst components such as alumina, silica-alumina and zeolites (e.g. Y and ZSM-5). Additives, e.g. Ce, La and Cu, can be deposited on the shaped bodies before, during or after aging (page 9, line 24-page 10, line 13). The conventional catalyst components can be added prior to the shaping step, e.g. spray drying (see page 8, lines 4-13; page 10, lines 25-26).

The subject-matter of claim 6 does therefore not involve an inventive step as required by Article 33(3) PCT.

- 2.4 The subject-matter of dependent claims 2-5, 7 and 8 do not contain subject-matter which could contribute to an inventive step being recognisable over the prior art cited, since the specification does not provide any unexpected effects or advantages associated with any of the differentiating features of the claims.

The subject-matter of dependent claims 2-5, 7 and 8 therefore lacks an inventive step (Article 33(3) PCT).

**Re Item VIII**

**Certain observations on the international application**

- 8.1 The term "solid solution" used in claim 1 is vague and unclear and leaves the reader in doubt as to the meaning of the technical features to which it refers, thereby rendering the definition of the subject-matter of said claim unclear, Article 6 PCT.

For the establishment of this opinion, the definition as given on page 3, lines 9-17, i.e. a disordered MgO-like product distinguishable from spinel and anionic clays, has been used to interpret the claim.

- 8.2 The feature of claim 2, that a REY zeolite is comprised in an amount of about 2-10 wt%, is not referred to in the description. Claim 2 is therefore not supported by the description as required by Article 6 PCT.